RESEARCH ARTICLES

1688 Fermi Observations of High-Energy Gamma-Ray Emission from GRB 080916C
The Fermi LAT and Fermi GBM Collaborations
This highly luminous gamma-ray burst had the largest apparent energy release yet measured.

1693 Comprehensive Characterization of Genes Required for Protein Folding in the Endoplasmic Reticulum
M. C. Jonikas et al.
A nine-protein transmembrane is among several hundred genes found to be critical for protein folding in the endoplasmic reticulum.

REPORTS

1698 Lubrication at Physiological Pressures by Polyzwitterionic Brushes
M. Chen et al.
Extremely low friction coefficients under high applied pressures are reported for polymeric brushes grafted to a surface.

1701 Controlled Formation of Sharp Zigzag and Armchair Edges in Graphitic Nanoribbons
X. Jia et al.
Joule heating is used to modify the defect structure along the edges of a graphene ribbon.

1705 Graphene at the Edge: Stability and Dynamics
Ç. O. Girit et al.
Atom rearrangement at the edges of a hole in a sheet of graphene is observed using transmission electron microscopy.

1708 Reversible Interactions with para-Hydrogen Enhance NMR Sensitivity by Polarization Transfer
R. W. Adams et al.
The nuclear spin polarization of para-hydrogen can be transferred to organic molecules when both bind to a metal complex.

1711 Increasing Hyperpolarized Spin Lifetimes Through True Singlet Eigenstates
W. S. Warren et al.
Singlet states between strongly coupled spins can be used to enhance the magnetic resonance imaging of organic molecules.

1714 Greatly Expanded Tropical Warm Pool and Weakened Hadley Circulation in the Early Pliocene
C. M. Brierley et al.
The warm tropics of the Early Pliocene, about 4 million years ago, extended much farther toward the poles than they do today.

1718 Structure of P-Glycoprotein Reveals a Molecular Basis for Poly-Specific Drug Binding
S. G. Aller et al.
A membrane protein that removes toxins and drugs from cells is caught binding two drug molecules in a large internal cavity.

1722 CD24 and Siglec-10 Selectively Repress Tissue Damage–Induced Immune Responses
G.-Y. Chen et al.
A signaling pathway involving an immune protein protects cells against the potentially fatal immune response induced by tissue damage.

1726 Visualizing Antigen-Specific and Infected Cells in Situ Predicts Outcomes in Early Viral Infection
Q. Li et al.
Mapping the rate and magnitude of early events in viral infections predicts the success or failure of immune control.

1729 Infection by Tubercular Mycobacteria Is Spread by Nonlytic Ejection from Their Amoeba Hosts
M. Hagedorn et al.
Tubercular bacteria can slip undetected from host cell to host cell via specialized exit structures called ejectosomes.

1734 Critical Population Density Triggers Rapid Formation of Vast Oceanic Fish Shoals
N. C. Makris et al.
A shift from disordered to highly synchronized behavior is seen in hundreds of millions of Atlantic herring at a critical population density.

1737 Genetic Contribution to Variation in Cognitive Function: An fMRI Study in Twins
J. W. Koten Jr. et al.
Analysis of identical and fraternal twins shows genetic influence on brain activation during arithmetic and memory tasks.

1740 Changes in Temperature Preferences and Energy Homeostasis in Dystroglycan Mutants
K. Takeuchi et al.
Mutation of a membrane protein alters mitochondrial metabolism and temperature preference in flies.

1743 Quantitative 3D Video Microscopy of HIV Transfer Across T Cell Virological Synapses
W. Hübner et al.
HIV uses the endocytic pathway to spread through virological synapses between immune cells.

1747 A Transposon-Based Genetic Screen in Mice Identifies Genes Altered in Colorectal Cancer
T. K. Starr et al.
A functional screen in mice uncovers genes that are likely to drive the growth of gut-specific tumors.
An intramolecular switch regulates phosphoindependent FHA domain interactions in Mycobacterium tuberculosis.

T. J. Nott et al.

Binding of Rv1827 to target proteins through its forhead-associated (FHA) domain does not require their prior phosphorylation at threonine residues.

RESEARCH ARTICLE: Dynamic Signaling in the Hog1 MAPK Pathway Relies on High Basal Signal Transduction

J. Macia et al.

High intrinsic basal signaling in mitogen-activated protein kinase pathways ensures proper dynamic responses to environmental stimuli.

PERPECTIVE: Challenges and Opportunities in Defining the Essential Cancer Kinome

B. D. Manning

RNAi screens for essential kinases reveal that the potential therapeutic kinase universe is larger than expected.

PERPECTIVE: Amyloid Goes Global

I. Bezprozvanny

Amyloid plaques have farther-reaching effects on astrocytes than previously suspected.

MEETING REPORT: Signal Transduction—Receptors, Mediators, and Genes

F. Entschladen et al.

Cell signaling researchers gathered in Weimar, Germany for the annual meeting of the Signal Transduction Society.

PRESENTATION: Early Events of B Cell Activation by Antigen

D. Depoil et al.

B cells undergo membrane spreading and contraction during activation in response to antigen-presenting cells.

PODCAST

S. J. Smardon and A. M. VanHook

The activity of a bacterial FHA domain–containing protein is regulated intramolecularly.

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E. Pain

A visual artist, a cartoonist, and a winemaker—all trained as scientists—are pursuing unexpected careers.

The Itinerant Artist

E. Pain

Angelo Vermeulen eventually reconciled his talent as a scientist with his passion for the arts with his scientific curiosity.

In Vino Oportunitas

Jeff Mangahas left scientific work to become an award-winning winemaker at Hartford Vineyards.

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